

REMARKS

Claims 54-92 are pending. Claims 56, 57 and 83-85 are withdrawn from consideration. By this Response, claims 54, 55, 58-68, 71-74 are amended and claims 86-92 are added. Reconsideration and allowance based on the above-amendments and following remarks are respectfully requested.

Claims Status

Applicants note an apparent mistake on PTOL-326 which provides the Office Action Summary. On this page it is state that claims 67, 68, 71 and 73 are withdrawn from consideration. Applicants respectfully submit in the Response date May 17, 2004 an election was made of Embodiment 1 which encompassed claims 54 and 58-85 with arguments directed towards claims 55-57 to be included with the grouping of claims. In Office Action dated August 6, 2004 the Examiner stated, in the Office Action Summary, that only claims 56-57 and 83-85 were withdrawn from consideration. The Examiner in this same Office Action rejected claims 54-55 and 58-82, thus verifying that only claims 56-57 and 83-85 were withdrawn from consideration.

Without reasoning the Examiner has included claims 67, 68, 71 and 73 as being withdrawn from consideration in the most recent Office Action dated January 26, 2005 on the Office Action Summary page. The Examiner, however, rejects these same claims in the body of the rejection in the same manner as they were rejected in the previous Office Action dated August 6,

2004. Therefore, Applicants believe the inclusion of claims 67, 68, 71 and 73 as being withdrawn in the Office Action Summary is an inadvertent mistake and these claims were examined on their merits as in they were in the previous Office Action date August 6, 2004. Thus, examination on the merits of these claims is believed to have been made by the Examiner and with the amendments made and the arguments presented below regarding the rejection of these claims, it is respectfully submitted that the claims are in condition for allowance.

§112, Second Paragraph

The Office Action rejects claims 54-55 and 58-82 under 35 U.S.C. §112, second paragraph as being indefinite. Specifically, the Office Action rejects claims 54, 55 and 74 alleging that the phrase “the bottom injector and top injector layers forming a p-n junction” is unclear. The Office Action alleges that the use of the term p-n junction when layers are provided between the top and bottom injectors is unclear.

In response, applicants have amended claims 54, 55 and 74 such that claims 54 and 55 recite “p-i-n junction” where i represents a material between the p and n layers. Claim 74 has been amended to remove the terminology of a p-n junction altogether. Accordingly, withdrawal of the rejection is respectfully requested.

Prior Art Rejection

The Office Action rejects claims 54, 58-60 and 62-63 under 35 U.S.C. §102(b) as being anticipated by Sweeny, et al. ("Resonant Interband Tunnel Diodes", Appl. Phys. Lett., pp. 54-58, 1989). This rejection is respectfully traversed.

Sweeny teaches the use of tunnel diodes having n-type material and p-type material including a tunnel barrier layer positioned between an n-type quantum well and p-type quantum well layer. See page 546. Sweeney does not teach a method of fabricating an interband tunnel diode.

The present invention, contrary to Sweeney, as defined by claim 54 recites a method of fabricating an interband tunnel diode, comprising the steps of: layering a bottom injector; layering a top injector adjacent to the bottom injector, such that the top injector is separated by an offset from the bottom injector and layering a material between the bottom injector and top injector which serves as a tunnel barrier, wherein the bottom injector layer, the top injector layer, and said material form a p-i-n junction, where i represents at least one material provided between the bottom injector and top injector.

Sweeney does not teach or suggest a method of fabricating an interband tunnel diode. Although Sweeney teaches an end product, the fabrication steps are not taught or suggested.

Further, the end product taught by Sweeney does not teach include features taught by the fabrication method of the present invention. The

embodiments of the present invention as defined by claim 54 include an offset separating the top injector and bottom injector and also a tunnel barrier positioned between the top and bottom injector to form a p-i-n junction.

Sweeny does not teach providing an offset between the top and bottom injector along with a tunnel barrier material between the top and bottom injectors to form a p-i-n junction as claimed. Sweeny merely teaches the use of a thin tunnel barrier layer and no other types of layers between the n and p type materials.

In view of the above, it is respectfully submitted that Sweeny fails to anticipate each and every feature as recited in independent claim 54.

Accordingly, reconsideration and withdrawal of the rejection of independent claim 54 and its dependent claims are respectfully requested.

In view of the above, applicants respectfully submit that claims 54, 55, 58-82, and 86-88 are distinguishable over the applied art. Accordingly, reconsideration of the above noted rejections and allowance of the application are earnestly solicited.

Conclusion


Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Chad J. Billings (Reg. No. 48,917) at the telephone number of the undersigned below, to

conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment(s)